

TABLE 6.—*Vitamin B Deficiency (Other than in Thiamin)*

Clinical Changes	Deficiency of	Tests
Pellagra	Nicotinic acid Thiamin Other factors?	Therapeutic only
Macrocytic anemia	Uncertain	Therapeutic only
Gastro-intestinal: glossitis, anorexia, achlorhydria, hypotonicity, hypomotility	Uncertain	Therapeutic only

such as gastro-intestinal symptoms or macrocytic anemia. These symptoms and findings may prove helpful in establishing the correct diagnosis.

Treatment.

In the treatment of thiamin deficiency the exhibition of all of the following measures will be found most helpful: an adequate diet high in vitamin B content, preparations of brewers' yeast or wheat germ and crystalline thiamin chlorid. While crystalline preparations are available they should not, for two reasons, be used exclusively in the treatment of thiamin deficiency: first, because, as has been pointed out, most patients with thiamin deficiency have evidence of deficiency of other components of the B complex, and secondly, because crystalline thiamin chlorid is still quite expensive.

For those patients with only moderate deficiency, and without evidence of impairment of gastro-intestinal function, the use of 30 grams of powdered brewers' yeast of good potency, or 6 grams of autolyzed yeast, administered three times daily, is generally adequate. Along with this should be a high caloric, high vitamin diet, if it can be tolerated, and from 10 to 40 milligrams of thiamin chlorid daily, intramuscularly or orally administered. For those patients with severe cardiac symptoms, daily intramuscular or intravenous injections of similar doses of thiamin may be advisable. In addition, dilute liver extracts, suitable for intramuscular injection, given in doses of 10 to 20 cubic centimeters or more daily, are helpful in controlling glossitis and cutaneous manifestations of the type associated with pellagra. As soon as the patient shows evidence of distinct improvement, the dose of crystalline thiamin may perhaps be reduced to 10 to 15 milligrams daily; but it is advisable to maintain large doses of thiamin and other portions of the vitamin B complex, in the form of food and of yeast and wheat germ.

DEFICIENCY OF VITAMIN B (OTHER THAN THIAMIN)

The vitamin B complex consists of a variety of factors other than thiamin, such as riboflavin, the P-P factor (nicotinic acid?), a filtrate factor, vitamin B₆, and others. However, so far only two members of the complex, namely, thiamin and the P-P factor, have been linked unquestionably with deficiency disease in man. (Table 6.)

490 Post Street.

(To be continued)

THE ROENTGEN DIAGNOSIS OF DISEASES OF THE ILEOCECAL REGION OF THE GASTRO-INTESTINAL TRACT*

By JOSEPH JELLEN, M.D.
Los Angeles

PART I

INTRODUCTION

THERE are a large number of disease entities which characteristically affect, and show a special predilection for, the ileocecal region of the gastro-intestinal tract. The purpose of this communication is to present a topographical classification of these conditions, in an attempt to facilitate the roentgen diagnosis. The conditions which are noted in the ileocecal segment of the intestine present a varied symptomatology, and differentiation on a clinical basis alone is difficult. In many instances, the diagnosis rests ultimately on the roentgen examination. The differentiation is particularly difficult in those instances where there is a history of pain in the right lower quadrant of the abdomen, associated with a palpable mass. Many of these conditions present a very similar roentgen appearance, and it is only by a consideration of all the possibilities, that we may hope to arrive at the proper diagnosis. In this regard, a topographical classification would seem to be of value.

A CLASSIFICATION OF DISEASES AFFECTING THE ILEOCECAL REGION FROM THE ROENTGENOLOGICAL STANDPOINT

I. Congenital Anomalies.

- (a) Transposition of the colon.
- (b) Anomalies of descent of the cecum.
- (c) Inverted cecum.

II. Ileocecal Bands.

- (a) Congenital.
- (b) Adhesions (postoperative).

III. Benign Tumors.

- (a) Fibroma.
- (b) Adenoma.
- (c) Papilloma.
- (d) Lipoma.
- (e) Angioma.
- (f) Myoma.
- (g) Carcinoid (argentaffine tumors).
- (h) Endometrial implants.
- (i) Mucous cysts.

IV. Malignant Tumors.

- (a) Carcinoma.
- (b) Sarcoma.

V. Specific Granulomas.

- (a) Ileocecal tuberculosis (primary and secondary).
 1. Ulcerative.
 2. Hyperplastic.
- (b) Actinomycosis.
- (c) Amebiasis.
 1. Amebic colitis (localized or diffuse).
 2. Amebic granuloma.

* From the Department of Radiology of the Queen of Angels Hospital, Los Angeles.

Read before the Radiology Section of the California Medical Association at the sixty-seventh annual session, Pasadena, May 9-12, 1938.

VI. Nonspecific Granulomas.

- (a) Nonspecific ulcerative granulomas (acute, subacute, and chronic).
 - 1. Regional ileitis.
- (b) Inflammatory granulomas secondary to
 - 1. Appendicitis.
 - 2. Typhlitis.
 - 3. Cecal diverticulitis.
- (c) Peri-intestinal granulomas (secondary to perforations of the bowel, *i. e.*, by fishbone or toothpick).

VII. Lymphoblastoma.

- (a) Hodgkin's disease.
- (b) Lymphosarcoma.
- (c) Follicular lymphoblastoma.

VIII. Appendiceal Infections.

- (a) Appendicitis.
- (b) Fecaliths of the appendix (calcified).
- (c) Appendiceal abscess.
- (d) Mucocele of the appendix.

IX. Intussusception.

- (a) Ileocecal.
- (b) Cecocolic.

X. Diverticulosis.

- (a) Diverticulitis of the cecum.

XI. Mesenteric Adenitis.

- (a) Nonspecific.
- (b) Associated with appendicitis, ileitis, etc.
- (c) Tuberculous.
- (d) Calcified.

XII. Localized Ulcerative Colitis (Proximal Colon Involved).

- (a) Specific.
 - 1. Amebic.
 - 2. Tuberculous.
- (b) Nonspecific.
 - 1. Localized hyperplastic colitis.
 - 2. Ulcerative colitis associated with regional ileitis.

CONGENITAL ANOMALIES OF THE COLON

Congenital anomalies of the proximal colon are occasionally noted in the gastro-intestinal examination. Nonrotation of the colon is found at times. More often, variations in the degree of descent and fixation of the cecum are observed. The changes noted often correspond to the habitus of the individual, and the large normal variation should be kept in mind before any symptoms are attributed thereto.

ILEOCECAL ADHESIONS

Adhesions in the ileocecal region may be either congenital or acquired. In the former category may be mentioned Lane's kink. In this condition there is angulation and constriction of the terminal ileum, due to the peritoneal reflection from the cecum. Formerly, there was great stress placed on the relation of the condition to chronic intestinal stasis. In the great majority of cases, adhesions are acquired and postoperative in nature. Perforated appendicitis with local peritonitis is a common cause for adhesions in the right lower quadrant of the abdomen. Adhesions secondary to adnexal disease in the female is also encountered. The condition is manifest, clinically, by abdominal pain, distention, and vomiting. In other cases there is evidence of varying degrees of intestinal obstruction.

The roentgen examination is of great value in the diagnosis. Loops of small intestine are matted together, and there is fixation noted during the roentgenoscopic examination. At times there is constriction of the terminal ileum with dilatation

of the intestinal loops proximal to the involved area. There is usually a delay in small intestinal motility, and a barium residue may be noted in the ileum as late as twenty-four hours after the ingestion of the barium meal. A residue in the small intestine from nine to twelve hours after the ingestion of the barium meal is suggestive of delay in small intestine motility. The normal variation in motility must be considered before attaching significance to the roentgen findings.

BENIGN TUMORS

Various types of benign neoplasms are found in the ileocecal region. Raiford¹ reported a series of forty-eight neoplasms of the small intestine situated in the ileum. The following types of benign tumors, in order of frequency, were found: adenoma, argentaffine tumors, lipoma, fibroma, myoma, hemangioma, and accessory pancreatic tissue. These benign tumors are usually silent until they are fairly large in size, at which time they become manifest by intestinal obstruction. Benign intestinal polyps are occasionally found in the proximal portion of the colon, although they are found more often in the distal colon and rectum. These tumors, though benign in origin, are regarded as precancerous and potentially malignant. According to various statistics, the incidence of cancer in intestinal polyps ranges between 25 and 50 per cent. Roentgenologically, these benign tumors appear as well defined, circumscribed, filling defects in the barium shadow. The double contrast enema is of great value in the demonstration of these neoplasms.

MALIGNANT TUMORS

Carcinoma of the cecum is seen quite often, whereas malignancy of the adjacent ileum is rather uncommon. According to statistics, carcinoma of the cecum comprises about 15 per cent, and carcinoma of the ileum about 3 per cent of intestinal cancers. Occasionally, carcinoma of the cecum involves the adjacent ileum by direct extension. Carcinoma of the cecum is most often of the polypoid type, and the mass is usually palpable on physical examination. The tendency of these tumors to produce marked secondary anemia is well recognized. From the roentgenologic standpoint, these malignant tumors offer very little difficulty in diagnosis. The presence of an irregular filling defect in the cecum is quite characteristic. Malignancy of the ileum is usually manifest by intestinal obstruction.

ILEOCECAL TUBERCULOSIS

Intestinal tuberculosis may affect any portion of the gastro-intestinal tract. The disease, however, is most frequently present in the ileocecal region. Ulcerative ileocecal tuberculosis, secondary to active pulmonary lesions is well known. Hyperplastic intestinal tuberculosis is much less common than ulcerative type, and may, or may not be secondary to tuberculous lesions elsewhere in the body. The hyperplastic type is characterized by an annular thickening of the wall of the bowel, with resultant stenosis of the intestinal lumen. The most common symptoms are abdominal cramps and diarrhea. At times the clinical picture is that of an acute or sub-

acute intestinal obstruction. On physical examination, a mass is very often palpable in the right lower quadrant of the abdomen. The roentgen findings in intestinal tuberculosis are characteristic, but not pathognomonic of the disease. In the ulcerative type, Stierlin's sign is noted. There is irritability, spasm, and localized hypermotility in the involved segment of intestine, and very little barium is retained in this portion of the intestines. In hyperplastic tuberculosis there is constriction and stenosis of the lumen, with obliteration of the normal mucosal markings. Occasionally, filling defects are noted, the appearance of which may simulate carcinoma.

ACTINOMYCOSIS

Actinomycosis of the intestine is often noted in the cecum, and it is present in this location in approximately 25 per cent of all cases. Pathologically, the cecum shows the same thickening as in the hyperplastic form of tuberculosis. Later, suppuration occurs, and the mass is replaced by a number of small abscesses in this region. The disease often spreads to, and perforates, the external abdominal wall, with the formation of chronic draining sinuses. The pus from the discharges contains the characteristic "sulphur granules," in which the ray fungus is demonstrated. Secondary involvement of other abdominal organs, particularly the liver, also occurs. Clinically, these cases must be differentiated from regional ileitis, as this disease is also characterized by persistent abdominal fistulae. In actinomycosis the roentgen examination reveals contraction of the cecum, and filling defects when the process is more advanced. Differentiation from hyperplastic tuberculosis and carcinoma of the cecum is difficult, and the ultimate diagnosis often rests on the demonstration of the ray fungus in the discharges.

AMEBIASIS

Amebic infection of the intestine occurs in two types. In the first, there is an ulcerative colitis of specific etiology which commonly involves the proximal colon. At times, the process spreads and involves the entire colon. Occasionally, there is retrograde involvement of the terminal ileum. The cecum is involved in approximately 85 per cent of the cases. The second type is characterized by the formation of localized granulomatous masses, which are found most often in the cecum and in the flexures of the colon. Gunn and Howard² report three cases of amebic granuloma of the colon, two of which involved the cecum. In this type there is marked thickening of the wall of the intestine, as a result of the large amount of granulation tissue present. Clinically, there is usually a palpable mass in the abdomen. The disappearance of these granulomatous lesions has been observed, after the administration of specific therapy for amebiasis. The symptoms of the ulcerative type are identical with nonspecific ulcerative colitis. Examination of the stools reveals the presence of the vegetative forms or cysts of *E. histolytica*. In the hyperplastic type, diarrhea is often absent, so that carcinoma is usually suspected. The roentgen appearance of amebic colitis is similar to the nonspecific type. The former should be suspected when the process is limited to

the proximal colon. In some cases the roentgen examination of the colon with the barium enema is negative, particularly in the early stage. In other instances, irritability and spasm of the intestines are the only positive roentgen findings. In the hyperplastic type there are filling defects in the barium shadow, the roentgen appearance of which may simulate carcinoma.

(To be continued)

REFERENCES

1. Raiford, T. S.: Tumors of the Small Intestine, *Arch. Surg.*, 25:122 (July), 1932.
2. Gunn, H., and Howard, N. J.: Amebic Granulomas of the Large Bowel, *J. A. M. A.*, 97:166 (July 18), 1931.

SELECTIVE ANESTHETIC PROGRAM : ITS DESIRABILITY *

By HALL G. HOLDER, M.D.
San Diego

DISCUSSION by W. Le Roy Garth, M.D., San Diego; Edwin H. Kelley, M.D., San Diego; Charles F. McCuskey, M.D., Glendale.

THE proper conduct of the anesthetic is a prime factor in the uncomplicated and successful outcome of surgical treatment together with a carefully planned and executed operation. We are indebted to the pharmacologist and anesthetist for the introduction of many new and efficient agents and improved methods of administration. These have broadened the field of anesthesia, so that a fundamental knowledge of the scope of each is necessary on the part of the surgeon if he is to provide the best agent for his patient. This selection must not only take into consideration the type of surgical treatment contemplated, but also physical, psychic and emotional handicaps. The surgeon has available the consulting or referring physician in evaluating complicating organic disease and emotional reactions of the patient toward the prospective operation. However, just as the physician who recommends a surgeon to the patient takes a definite responsibility in the eyes of the patient and his family, so the surgeon and not the anesthetist is held directly responsible for all details of the surgical procedure. Most patients are informed, in a general way, of the progress of anesthesia and for the most part the type of anesthesia must be discussed and at least tentatively decided upon, together with facts concerning the operation, hospital accommodations, fees and other details of vital interest to him. The relation of patient and surgeon is direct and personal as a result of careful study and discussion of the problems of treatment involved. It is only fair to the anesthetist that the usual impersonal attitude toward his services be corrected and the function of the anesthetist as a consultant be explained, and any suggestions for the betterment or safety of the anesthetic program be communicated to the patient. This, I believe, can best be done on admission of the patient to the hospital by a formal visit and consultation with the

* Read before the Anesthesiology Section of the California Medical Association at the sixty-seventh annual session, Pasadena, May 9-12, 1938.